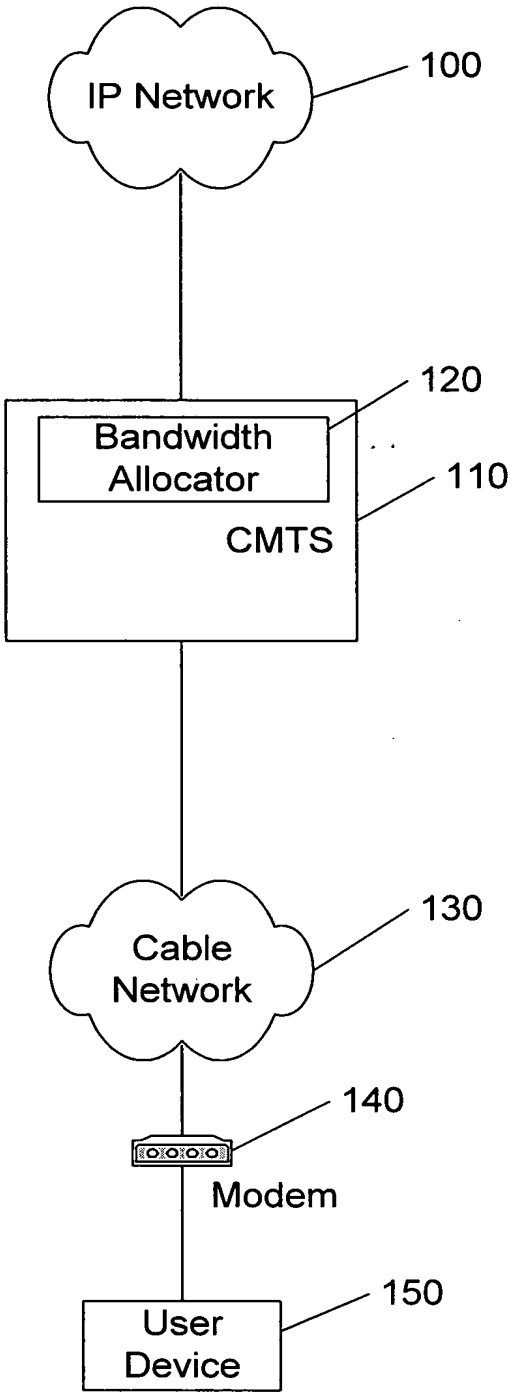
IP Network
100
120
Bandwidth Allocator
110
CMTS
Cable Network
130
140
Modem
User Device
150

Figure 1

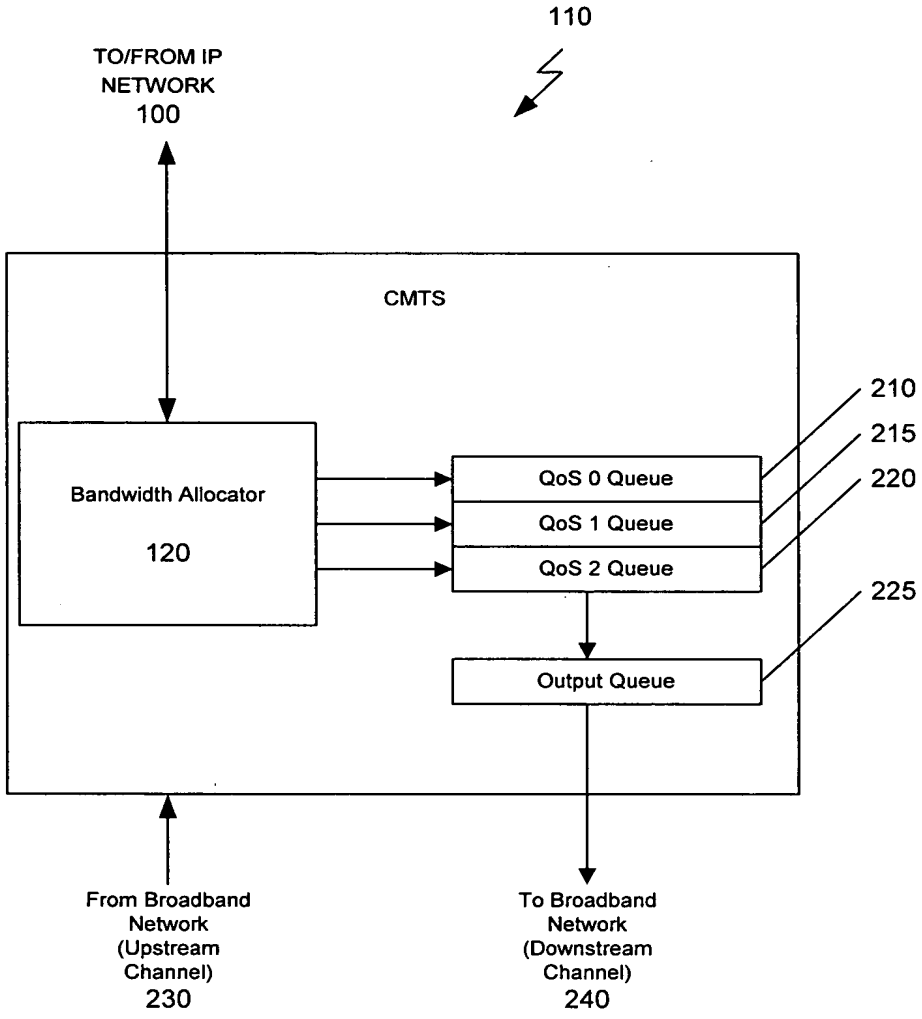
110
TO/FROM IP
NETWORK
100
CMTS
Bandwidth Allocator
120
QoS 0 Queue
QoS 1 Queue
QoS 2 Queue
Output Queue
210
215
220
225
From Broadband
Network
(Upstream
Channel)
230
To Broadband
Network
(Downstream
Channel)
240

Figure 2

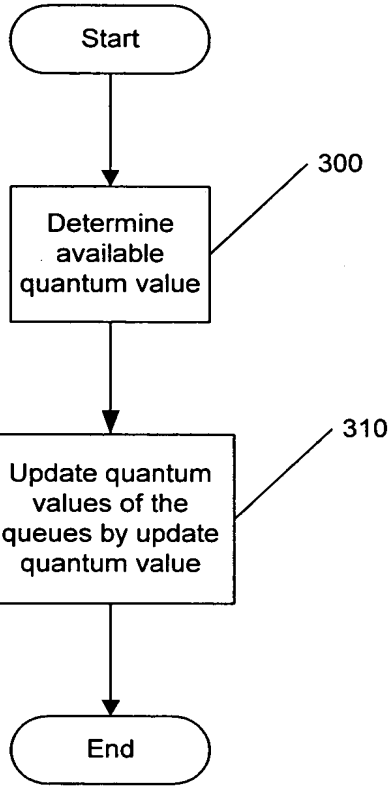
Start
300
Determine available quantum value
310
Update quantum values of the queues by update quantum value
End

Figure 3

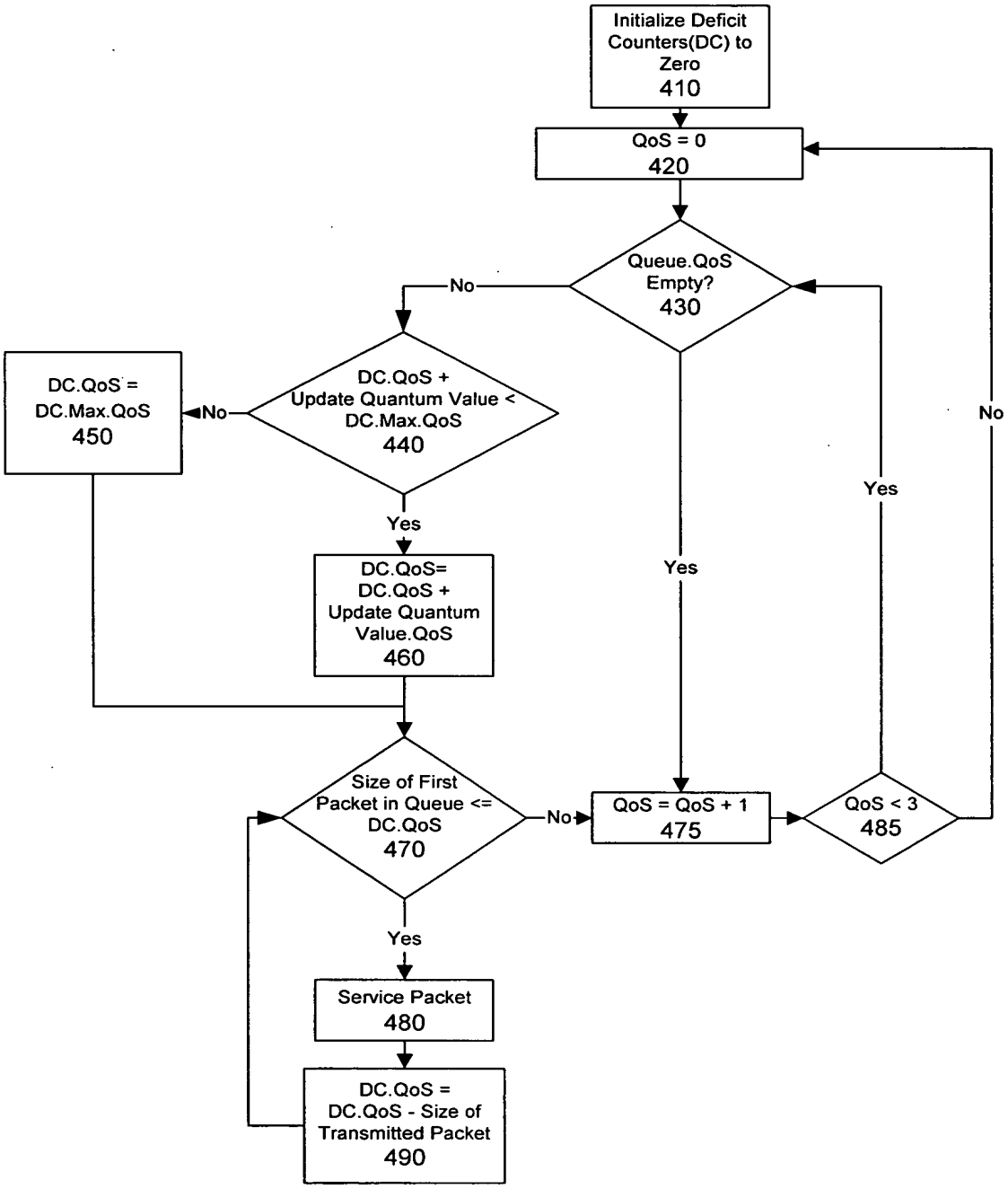
Initialize Deficit Counters(DC) to Zero
410
QoS = 0
420
Queue.QoS Empty?
430
No
Yes
DC.QoS + Update Quantum Value < DC.Max.QoS
440
No
DC.QoS = DC.Max.QoS
450
Yes
DC.QoS= DC.QoS + Update Quantum Value.QoS
460
Size of First Packet in Queue <= DC.QoS
470
No
QoS = QoS + 1
475
QoS < 3
485
No
Yes
Yes
Service Packet
480
DC.QoS = DC.QoS - Size of Transmitted Packet
490

Figure 4

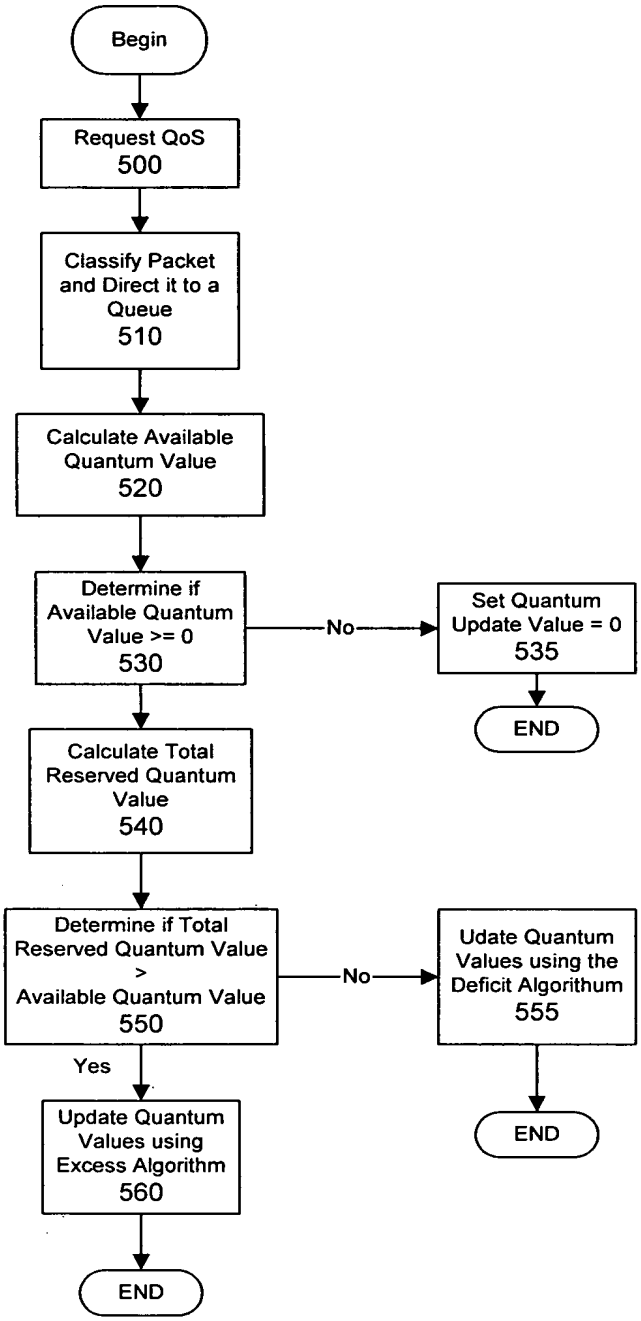
Begin
Request QoS
500
Classify Packet and Direct it to a Queue
510
Calculate Available Quantum Value
520
Determine if Available Quantum Value >= 0
530
No
Set Quantum Update Value = 0
535
END
Calculate Total Reserved Quantum Value
540
Determine if Total Reserved Quantum Value > Available Quantum Value
550
No
Udate Quantum Values using the Deficit Algorithum
555
END
Yes
Update Quantum Values using Excess Algorithm
560
END

Figure 5

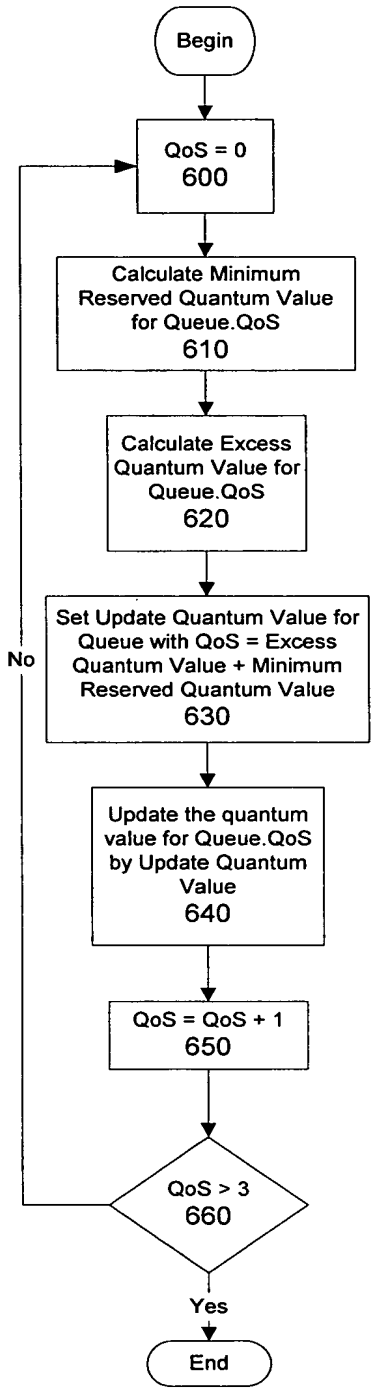
Begin
QoS = 0
600
Calculate Minimum Reserved Quantum Value for Queue.QoS
610
Calculate Excess Quantum Value for Queue.QoS
620
Set Update Quantum Value for Queue with QoS = Excess Quantum Value + Minimum Reserved Quantum Value
630
Update the quantum value for Queue.QoS by Update Quantum Value
640
QoS = QoS + 1
650
QoS > 3
660
No
Yes
End

Figure 6

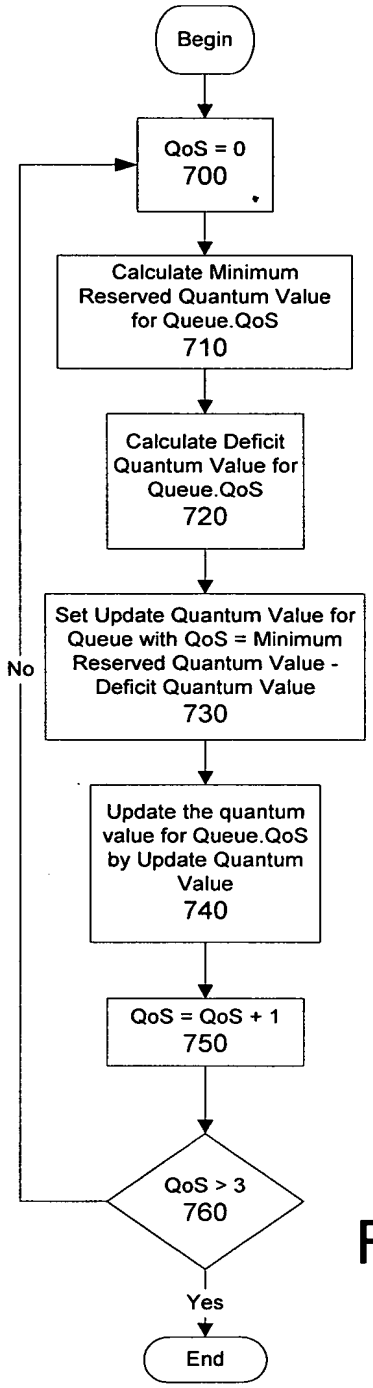
Begin
QoS = 0
700
Calculate Minimum Reserved Quantum Value for Queue.QoS
710
Calculate Deficit Quantum Value for Queue.QoS
720
Set Update Quantum Value for Queue with QoS = Minimum Reserved Quantum Value - Deficit Quantum Value
730
Update the quantum value for Queue.QoS by Update Quantum Value
740
QoS = QoS + 1
750
QoS > 3
760
No
Yes
End

Figure 7